

A NEW SPECIES OF *EUPSOPHUS*
(ANURA: LEPTODACTYLIDAE) FROM
CONTULMO, NAHUEL BUTA RANGE,
SOUTHERN CHILE

Juan Carlos Ortiz, Héctor Ibarra-Vidal, and J. Ramón Formas

Abstract.—*Eupsophus contulmoensis*, a new species of leptodactylid frog is named from the locality of Contulmo, Nahuelbuta Range, Southern Chile. This species is distinguished from its congeners by the dark-purple dorsum and the bright yellow coloration of its belly. This frog displays lumbar amplexus and is known only from the type locality.

The Nahuelbuta Range is that part of the Chilean Coastal Range bounded to the northeast by the Biobio river and to the south by the Imperial river (see Fig. 1). This mountainous area of southern Chile is approximately 175 km in length and reaches 1530 m at its greatest elevations (Alto de Nahuelbuta). The Nahuelbuta Range is covered by *Nothofagus* temperate forest and at elevations of more than 1000 m the conifer *Araucaria araucana* is present.

In this area three endemic anuran species are found (*Telmatobufo bullocki*, *Alsodes vanzolinii*, and *Alsodes barrioi*) (Schmidt 1952, Formas 1981, Veloso et al. 1981). Nonendemic species include: *Bufo rubropunctatus*, *Pleurodema thaul*, *Rhinoderma darwinii*, *R. rufum*, *Hylorina sylvatica*, *Batrachyla leptopus*, *B. taeniata*, *Eupsophus roseus*, and *E. vittatus*.

The Nahuelbuta Range shows a high degree of human-induced disturbance (pine groves of *Pinus radiata*) and little original forest remains. One of these areas is the Natural Monument of Contulmo (37°02'S; 78°12'W), where a series of herpetological collections were made between 1986 and 1987. As a result of this fieldwork a new species of frog of the genus *Eupsophus* was collected.

Eupsophus contulmoensis, new species
Fig. 2

Holotype.—MZUC (Museo de Zoología, Universidad de Concepción, Chile) 17141, adult female collected by Hector Ibarra-Vidal, 10 Jul 1987 at Contulmo, Malleco Province, Nahuelbuta Range, alt. 700 m, 15 km W (by road) of Purén, Chile (Fig. 1).

Paratypes.—Four adults (MZUC 17142, 17145, 17148, 17149) and one subadult (MZUC 17144) collected at the type locality.

Diagnosis.—A medium-sized species of *Eupsophus* (34.0–42.5 mm SVL), distinguished from its congeners (*E. roseus*, *E. migueli*, *E. calcaratus*, *E. insularis* and *E. vittatus*) by the dark purple dorsal pigmentation and bright yellow belly; upper part of the iris bronze-yellow in life and inner palmar tubercle prominent.

Description of adult (based on five fixed specimens).—Head slightly wider than long. Snout rounded in dorsal and lateral view, canthus rostralis concave, loreal area slightly concave, nostrils located laterally, at middistance between snout tip and orbit; eye length greater than distance between eye and nostril; interorbital distance smaller than eye length but greater than internarial

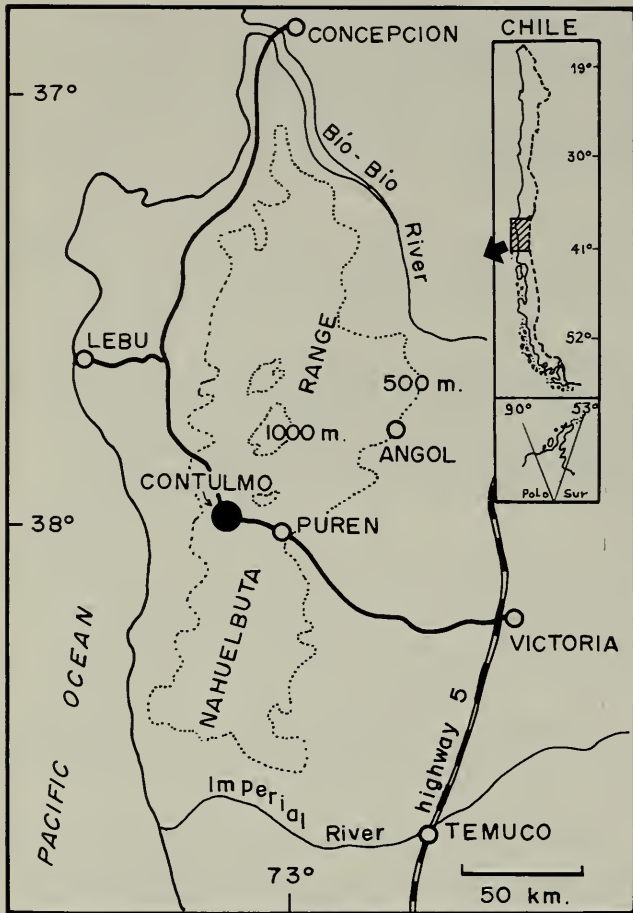


Fig. 1. Situation of the type locality (Contulmo) of *E. contulmoensis*.

distance. Tympanic membranes present and well developed. Supratympanic fold absent. Tongue round, notched at tip. Choanae rounded, dentigerous processes of vomers lying below the choanae; each process bearing five or six sharp teeth.

Forelimbs slender, first finger equal in length to second, third finger much longer than fourth; digital length in decreasing order 3-4-2-1. Palmar webbing absent; tips of fingers rounded and slightly protuberant. Inner palmar tubercle prominent; outer palmar tubercle ovoid and well developed; subarticular tubercles rounded and moderate in size; supernumerary palmar tubercles absent. Toes long, slender; tips of toes round; third and fifth equal in length; toes in decreasing order of length 4-(3,5)-2-1. Inner metatarsal tubercle ovoid and prominent; supernumerary tubercles absent; outer metatarsal tubercle tiny. Rudiment of web between toes.



Fig. 2. *Eupsophus contulmoensis*, new species. Holotype (MZUC 17141), female.

Anal opening rounded and directed postero-ventrally at dorsal level of thighs.

Dorsal and ventral skin smooth. Two faintly marked folds extending from posterior part of eye to the midlateral part of body.

Pectoral girdle arciferal; omosternum cartilaginous with short thin stem; tip sharply acute; sternum rectangular in shape with slight median constriction, its tip rounded and almost completely calcified. External measurements are shown in Table 1.

Color and color patterns.—In life dorsal ground color of head and body dark purple, two specimens (MZUC 17142, 17148) with yellow vertebral line (Fig. 3); dorsal limb surfaces dark purple with small yellow irregular spots; throat dark brown with minute irregular yellow spots; ventral surface brown and marbled with yellow; two specimens (MZUC 17141, 17144) with immaculate bright yellow abdomen; ventral surface of limbs with yellow irregular spots; yellowish irregular marks on side of head and body; upper part of iris bronze-yellow.

In alcohol dorsal surfaces dark brown and

Table 1.—Measurements of the type series of *Eupsophus contulmoensis* (mm).

	Holotype MZUC 17141 female	MZUC 17142 female	MZUC 17145 female	MZUC 17148 female	MZUC 17149 male	MZUC 17144 male subadult
Snout-vent length	45.2	39.4	43.0	44.4	38.1	34.0
Tibia length	24.2	24.5	23.5	23.4	21.4	19.5
Foot length	34.1	33.3	30.8	33.8	31.6	26.5
Head length	15.3	13.8	13.9	14.8	15.4	11.9
Head width	16.3	16.2	16.2	17.2	15.7	12.7
Interorbital distance	5.5	4.5	4.7	5.1	5.5	3.7
Internarial distance	3.7	3.7	4.3	4.3	4.1	3.3
Diameter of eye	6.1	5.2	5.1	5.4	5.6	4.1
Diameter of tympanum	2.6	2.6	2.2	2.7	2.1	1.6
Eye-nostril	4.4	4.1	2.9	3.4	2.7	2.3

vertebral line whitish; ventral areas brown and whitish spotted.

Distribution.—Known from the type locality.

Etymology.—The specific name of this frog is after the type locality.

Natural history.—The type locality, Contulmo, is a small natural reserve (approximately 1 km²), in the Nahuelbuta Range, where the original *Nothofagus* forest yet survives. Contulmo is situated in the mediterranean perhumid region (di Castri 1968). The annual mean temperature is 12.6°, the relative humidity is 82% and the annual mean rainfall is 1896 mm (Hajek and di Castri 1975). The following trees occur there: *Nothofagus oblicua*, *N. dombeyi* (Fagaceae), *Eucryphia cordifolia* (Eucryphiaceae), *Persea lingue* (Lauraceae), *Laurelia philippiana* (Monomiaceae), and *Aetoxicum punctatum* (Aetoxicaceae). The climber *Lapageria rosea* (Phileseaceae) was observed on logs. Ferns (*Lophosoria quadripinnata*, and *Ctenitis spectabilis*) and the moss *Dendroligotrichum dendroides* were collected on the ground. During winter, frogs were collected under decaying logs and stones near streams.

The following species of amphibians were also collected at the type locality: *Eupsophus roseus*, *E. vittatus*, *Batrachyla leptopus*, and *Rhinoderma darwinii*.

A female collected in spring (Nov 1987) had 65 white oocytes (1.14–2.28 mm di-

ameter) in its ovaries, and a male had testes 4.6 mm in length. Mature males did not have nuptial asperities in winter, however the gular areas were darker than in the animals collected. In the laboratory inguinal amplexus was observed.

The stomach contents of two *Eupsophus contulmoensis* collected on 7 Nov 1987, were examined. Both specimens were killed just after capture. The following food items were identified: Oligochaeta (4), Aranea (3), Diplopoda (2), Coleoptera (2), Diptera (1), Collembola (1), and Formicidae (1). Two specimens collected in 5 Sep 1987 had empty stomachs.

Comparisons

Eupsophus contulmoensis is a frog of moderate size (\bar{x} = 42.0 mm snout-vent length) as are *E. calcaratus* (\bar{x} = 35.1 mm, Formas & Vera 1982), *E. migueli* (\bar{x} = 35.5 mm, Formas 1978), *E. roseus* (\bar{x} = 36.0 mm; Cei 1962), and *E. insularis* (\bar{x} = 39.3 mm, Formas & Vera 1982). These species are notably smaller than *E. vittatus* (\bar{x} = 59.4, mm Grandison 1961). *Eupsophus contulmoensis* and *E. insularis* differ in the dorsal color and in the shape of the tip of the sternum. The latter species is dark brown with yellow irregular spots on the dorsum and the sternum is truncated whereas *E.*



Fig. 3. Color pattern variation in *E. contulmoensis* (not to scale). Dorsal patterns (above) and ventral patterns (below) of the specimens MZUC 17144, 17148.

contulmoensis is dark purple dorsally with a rounded sternum. The upper part of the iris is bronze yellow in *E. contulmoensis* and the dorsal area is unmarked, while in *E. roseus* the upper part of the iris is orange and an hour-glass shaped mark is present on its dorsum. *Eupsophus contulmoensis*, *E. migueli* and *E. calcaratus* have a similar colored upper iris (bronze yellow), but these species differ in the ventral color and pattern. The belly of *E. migueli* is wine red with irregular white spots whereas the ventral area of *E. contulmoensis* is dark brown with bright yellow irregular spots. In *E. calcaratus* the spots are also present. On the other hand the dorsum of *E. migueli* and *E. cal-*

caratus exhibits a typical hour-glass pattern that is absent in *E. contulmoensis*.

Acknowledgments

Collecting permits were graciously issued by Carlos Sepulveda, Director of Corporación Nacional Forestal (CONAF, VIII Región). We are grateful to Ismael Matamala, ranger of the Natural Monument of Contulmo, for his field assistance. Roberto Rodríguez identified the plants. Fieldwork was supported by Dirección de Investigación Universidad de Concepción (Proyecto 20.38.04). Corina Zuñiga typed the manuscript.

Literature Cited

- Cei, J. M. 1962. El género *Eupsophus* en Chile.—*Investigaciones Zoológicas Chilenas* 8:7–42.
- di Castri, F. 1968. Esquisse écologique du Chili. Pp. 7–52 in Doutteville and Rapaport, eds., *Biologie de l'Amérique Australe* vi. Editions du Centre National de la Recherche Scientifique.
- Formas, J. R. 1978. A new species of leptodactylid frog (*Eupsophus*) from the Coastal Range in Southern Chile.—*Studies on Neotropical Fauna and Environment* 13:1–19.
- . 1981. The identity of the frog *Eupsophus vanzolinii* from Ramadillas, Nahuelbuta Range, Southern Chile.—*Proceedings of the Biological Society of Washington* 93:920–927.
- , & M. I. Vera. 1982. The status of two Chilean frogs of the genus *Eupsophus* (Anura: Leptodactylidae).—*Proceedings of the Biological Society of Washington* 95:594–601.
- Grandison, A. G. 1961. Chilean species of the genus *Eupsophus* (Anura: Leptodactylidae).—*Bulletin of the British Museum (Natural History)* 9:111–149.
- Hajek, E. R., & F. di Castri. 1975. *Bioclimatografía de Chile*. Universidad Católica de Chile, Santiago, 107 pp.
- Schmidt, K. P. 1952. A new leptodactylid frog from Chile.—*Fieldiana, Zoology* 34:11–15.
- Veloso, A., P. Iturra, & M. Penna. 1981. Descripción de una nueva especie de telmatobino del género *Alsodes* (Amphibia, Leptodactylidae) de la cordillera de Nahuelbuta (Sur de Chile).—*Medio Ambiente* 5:115–121.
- (JCO and HIV) Departamento de Zoolo-
gía, Universidad de Concepción, Casilla
2407-10, Concepción, Chile; (JRF) Insti-
tuto de Zoología, Universidad Austral de
Chile, Casilla 567, Valdivia, Chile.